

FORM PTO-1390 (Modified) (REV 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				11016-0006
INTERNATIONAL APPLICATION NO PCT/FR00/01604		INTERNATIONAL FILING DATE 09 June 2000 (09.06.00)		U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 10/009588
TITLE OF INVENTION MAGNETIC COATING, COATING METHOD WITH SAME AND COATING APPARATUS THEREFOR		PRIORITY DATE CLAIMED 15 June 1999 (15.06.99)		
APPLICANT(S) FOR DO/EO/US Katia TEXIER and Claude TEXIER				
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:				
<ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below. 4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31). 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c) (2)) <ol style="list-style-type: none"> a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). b. <input checked="" type="checkbox"/> has been communicated by the International Bureau c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3)) <ol style="list-style-type: none"> a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input checked="" type="checkbox"/> have been communicated by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. 8. <input checked="" type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). 10. <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)). 11. <input type="checkbox"/> A copy of the International Preliminary Examination Report (PCT/IPEA/409). 12. <input type="checkbox"/> A copy of the International Search Report (PCT/ISA/210). 				
Items 13 to 20 below concern document(s) or information included:				
<ol style="list-style-type: none"> 13. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 14. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 15. <input type="checkbox"/> A FIRST preliminary amendment. 16. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 17. <input type="checkbox"/> A substitute specification. 18. <input type="checkbox"/> A change of power of attorney and/or address letter. 19. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825. 20. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4). 21. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). 22. <input type="checkbox"/> Certificate of Mailing by Express Mail 23. <input type="checkbox"/> Other items or information: 				

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 107009588	INTERNATIONAL APPLICATION NO. PCT/FR00/01604	ATTORNEY'S DOCKET NUMBER 11016-0006																
24. The following fees are submitted:		CALCULATIONS PTO USE ONLY																
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) : <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 85%;"><input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO</td> <td style="width: 15%; text-align: right;">\$1040.00</td> </tr> <tr> <td><input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO</td> <td style="text-align: right;">\$890.00</td> </tr> <tr> <td><input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO</td> <td style="text-align: right;">\$740.00</td> </tr> <tr> <td><input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4)</td> <td style="text-align: right;">\$710.00</td> </tr> <tr> <td><input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4)</td> <td style="text-align: right;">\$100.00</td> </tr> </table>		<input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO	\$1040.00	<input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO	\$890.00	<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	\$740.00	<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4)	\$710.00	<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4)	\$100.00							
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<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">CLAIMS</th> <th style="width: 25%;">NUMBER FILED</th> <th style="width: 25%;">NUMBER EXTRA</th> <th style="width: 25%;">RATE</th> </tr> </thead> <tbody> <tr> <td>Total claims</td> <td>21 - 20 =</td> <td>1</td> <td>x \$18.00 \$18.00</td> </tr> <tr> <td>Independent claims</td> <td>3 - 3 =</td> <td>0</td> <td>x \$84.00 \$0.00</td> </tr> <tr> <td colspan="2">Multiple Dependent Claims (check if applicable).</td> <td><input type="checkbox"/></td> <td style="text-align: right;">\$0.00</td> </tr> </tbody> </table>		CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	Total claims	21 - 20 =	1	x \$18.00 \$18.00	Independent claims	3 - 3 =	0	x \$84.00 \$0.00	Multiple Dependent Claims (check if applicable).		<input type="checkbox"/>	\$0.00	
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a. <input type="checkbox"/> A check in the amount of _____ to cover the above fees is enclosed. b. <input checked="" type="checkbox"/> Please charge my Deposit Account No. 50-1088 in the amount of \$519.00 to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-1088 A duplicate copy of this sheet is enclosed. d. <input type="checkbox"/> Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.																		
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.																		
SEND ALL CORRESPONDENCE TO: <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Conrad J. Clark Clark & Brody 1750 K Street, NW, Suite 600 Washington, DC 20006 Telephone: 202-835-1111 Facsimile: 202-835-1755 </div> <div style="display: flex; justify-content: space-between;"> <div style="flex: 1;"> <p>Conrad J. Clark</p> <p>SIGNATURE</p> <p>Conrad J. Clark</p> <p>NAME</p> <p>30,340</p> <p>REGISTRATION NUMBER</p> <p>December 11, 2001</p> <p>DATE</p> </div> </div>																		

A MAGNETIC COATING, A METHOD OF APPLYING SUCH A COATING, AND
A COATING APPARATUS FOR IMPLEMENTING THE METHOD

5 The present invention relates mainly to a magnetic coating, to a method of applying such a coating to outside surfaces, in particular of sheet or roll material, and to a coating apparatus implementing said method.

10 The invention applies to the field of games, in particular puzzles, board games, educational or teaching materials, to the field of paper-making, to decoration, or to building: wall coverings, removable fixing by means of magnetized elements, magnetic pressing or signaling means, covering plastered surfaces, e.g. surfaces of plaster board, or electromagnetic shielding. The invention also applies to the field of advertising, for example for outdoor and indoor 15 posters or displays.

20 It is known, e.g. from document GB 1 444 858 A, to provide various objects with a magnetized surface so as to enable them to be fixed temporarily onto a ferromagnetic support, such as a refrigerator door, an armored door, or the like. Furthermore, iron sheets have been used as supports for games having magnetized pieces such as chess sets. Unfortunately, most surfaces such as walls, sheets of cardboard or the like, are not capable of retaining magnets. Similarly, it is not commonplace to have magnetic supports 25 that are flexible and capable of being rolled up or folded.

Document NL 8 202 336 discloses making a layer of permanent magnetization with particles of ferromagnetic powder in a dye. Such layers do not enable good magnetization to be obtained.

30 The present invention seeks to mitigate those drawbacks by proposing a magnetic coating that generates an anisotropic medium enabling the sliding and the magnetic attraction forces exerted by the coating to be optimized, said coating being suitable for applying to any medium, in 35 particular paper, card, sheets of flexible

or rigid plastics material, wallpaper, walls, etc. The magnetic efficiency of the forces exerted by particles in an anisotropic medium is 25% to 30% greater than that obtained in an isotropic medium.

The present invention also provides a method of applying such a coating onto a backing medium, the method comprising a step of applying a main binder on the medium while the medium is being guided by a conveyor, a step of controlled dispensing and uniform spreading of the fill of conductive particles in the resin, coupled with a step of directing the particles by magnetization, followed by a step of demagnetization, a step of covering the particles in a deposit of an additional binder, and a step of drying the assembly.

When the conductive particles are constituted at least in part by ferromagnetic particles, the magnetization step is followed by a demagnetization step so as to avoid disturbing subsequent steps, and the drying step is followed by a step of remagnetizing the particles.

In particular implementations:

• the controlled dispensing and spreading of the filler are implemented by programming the rate at which powder is delivered as a function of the density selected for the particles, and then by screening or measuring out the particles uniformly on the pre-glued medium; random distribution of the particles makes it possible for the top surface formed in this way to be of thickness that is controlled and uniform;

• the step of magnetization occurs once the particles are indeed spread through the main binder following the step of dispensing and spreading the particles, but before the binder actually sets by solidifying, so that the particles can still be directed; and

• the steps of dispensing, spreading, and magnetizing the particles are combined so that the particles are directed by magnetization prior to being actually spread through the binder.

An advantageous implementation consists in spraying an adhesive resin as a binder for covering the particles and in laminating a medium on the resulting top surface so as to act as a front medium. Any type of medium can be used as

the front medium, in particular: card, paper, cloth, flexible or rigid plastics sheet material, etc., with the nature of the front medium being either identical to or different from that of the back medium.

5 Alternatively, when it is not possible to envisage using a front medium because the raw appearance of the back medium is to be conserved, then the covering step can advantageously consist in spraying on a varnish as the additional binder.

10 The invention also provides a coating apparatus for implementing the method of the invention, the apparatus comprising means for feeding the medium, which feeding can be continuous or discontinuous depending on whether the medium is in roll or sheet form, means for applying a main 15 binder by means of presser rollers or by at least one nozzle, coupled to heater means, a tank of particles coupled to dusting means for dispensing the fill of particles, means for spreading the fill of particles through the main binder, electromagnetic means for producing an anisotropic magnetic 20 field for magnetizing the particles, a sprayer for spraying on the additional binder, and drying means.

25 In preferred examples, the duster is programmed to deliver a quantity of powder corresponding to the density selected for the filler, said density preferably lying in the range 100 grams per square meter (g/m^2) to 900 g/m^2 , the binder applicator means preferably delivering about 10 g/m^2 to 50 g/m^2 of binder, the spreading means being constituted by a system of vibrating screens or by at least one measuring-out device, suitable for forming particular 30 patterns by masking, and the electromagnetic magnetization means are formed by an electromagnet.

In advantageous embodiments of said apparatus:

35 · when the filler comprises at least some ferromagnetic particles, a demagnetizer is disposed immediately downstream from the electromagnetization means, and a final magnetizer is disposed downstream to the drying tunnel;

· when the feed is performed continuously, the medium is fed from a winding-off roller, with the front medium where appropriate being fed likewise by a winding-off roller coupled to presser rollers on the conveyor, and a final 5 winding roller delivers a roll of the product obtained by the method of the invention; and

· when the feed is performed discontinuously, the medium is fed sheet by sheet onto the conveyor from a feeder bin, and the front medium is fed where appropriate likewise 10 from a sheet feeder bin, the feeder bins and the means for spreading the fill of particles being controlled by an automatic delivery system adjusted to a travel rate; and the binder applicator means and, where appropriate, the means for applying the additional binder, are adjusted by an 15 optical sequential controller having photoelectric cells connected to the automatic delivery system.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be better understood from the following description and the accompanying figures given 20 as non-limiting examples and showing:

· Figure 1 is a diagrammatic side view of an example of continuous coating apparatus for implementing the method of the invention; and

· Figure 2 is a diagrammatic side view of an example of 25 discontinuous coating apparatus for implementing the method of the invention.

MORE DETAILED DESCRIPTION

In Figure 1, the coating apparatus shown has various 30 continuous workstations that are used in combination, in alternation, or optionally. The apparatus is a single-sided device, it being understood that two-sided apparatus would not go beyond the ambit of the present invention. The non-limiting example shown describes wallpaper being coated in 35 order to illustrate how the apparatus operates.

The apparatus comprises a winding-off feed roll 10 for delivering backing paper 11, which roller is rotated by

presenting the desired grain size and long-term stability, in particular chemical stability. For example, it is possible to use soft iron, quenched iron, ferrite, any iron oxide, ferromagnetic rare earth, samarium, barium, or cobalt. In a variant, iron particles are used that are covered in a material that provides protection against corrosion, e.g. a layer of cobalt. It is also possible to use chromium, chromium oxide, and the particles used for coating magnetic tapes.

The iron oxide particles used are in the form of elongate rods and present small grain size so as to obtain a smooth surface state. Excellent results have been obtained using iron oxide with grain size equal to 24 micrometers (μm), and smaller grain size are also suitable. If a grainy surface state is accessible, then it is possible to use larger grain sizes, e.g. lying in the range 25 μm to 300 μm .

A system of vibrating screens (not shown) is coupled to the duster 51 so as to spread the particles uniformly over the pre-glued backing paper. In a variant, a programmable measuring-out unit can be used so as to adapt the quantity of powder that is to be deposited. Deposition can be performed to occupy predetermined patterns by masking with pre-cutout stencils.

A magnetic field induced by an electromagnet 60 is created in order to use magnetization to direct the particles that have just been deposited in the adhesive resin, i.e. prior to the glue solidifying. The use of a hot-melt glue in this implementation is particularly advantageous since opening and closing thereof is easily controlled. Alternatively, the magnetic field is formed between the duster and the spreader means. This solution is advantageous when the powder used is of a kind that gives rise to a "wicking" phenomenon that can spoil the uniformity of the deposit on the paper.

Magnetization is performed by polarizing the particles magnetically. The coated paper passes through the air gap of the electromagnet 60 which generates a substantially

uniform magnetic field across the entire width of the paper. By way of example, an electromagnet is used which generates an intense magnetic field that is substantially equal to 0.5 Teslas. It should be observed that care is taken to 5 ensure that the viscosity of the covering of the present invention and the amplitude of the magnetic field are such as to avoid any migration of particles out from the binder so as to become stuck in the air gap of the electromagnet. Similarly, guide means (not shown) prevent the paper covered 10 in the covering of the present invention sticking against one of the poles of the magnet, supposing a permanent magnet is used.

The coated paper then passes beneath a demagnetizer 70 placed immediately downstream from the electromagnetic 15 magnetizing means.

If the coating constituted by the particle-filled resin is to be visible on the paper, then it can be advantageous to use a paint as the binder so as to provide a desired color. However the ferromagnetic particles can alter the 20 color of the paint. If this effect is undesired, it is possible subsequently to cover it in one or more layers of paint having no ferromagnetic filler. A sprayer 80 then deposits additional binder. The flow rate of this sprayer is adjusted so that all of the particles are embedded in the 25 binder. This binder could equally well be a varnish, e.g. a translucent varnish if it is desired to conserve a view of the backing paper in the background.

A front medium of paper is then deposited in this example, and the sprayer 80 is used to deliver glue as the 30 additional binder. The front medium feed 14 takes place likewise from a winding-off roll 90 coupled to presser rollers 91 acting against the conveyor.

A drying tunnel 100 or in the alternative heater 35 rollers, and a final magnetizer 110 located downstream from the drying tunnel are provided. The magnetizer is a drum coupled to rotate with the conveyor, having alternating north and south poles at a previously determined magnetic

pitch. The travel speed and the magnetization speed is of the order of 80 m/min, the applied voltage is of the order of 2000 volts (V) to 3000 V, delivering a field of 8000 gauss to 9000 gauss for paper widths lying in the range 5 700 millimeters (mm) to 1400 mm.

A final winding roller 120 delivers a roll of the product obtained by method of the invention.

In order to provide shielding against electromagnetic radiation, it is advantageous to provide a fill of 10 ferromagnetic particles that is sufficient to make the covering of the present invention conductive, at least at the frequencies which are to be eliminated. In a variant, non-ferromagnetic conductive particles are used, e.g. copper particles, either in addition to or as a replacement for 15 ferromagnetic particles in order to form shielding or a Faraday cage. Such shielding makes it possible to protect electronic equipment, in particular telecommunications equipment and computer equipment from external disturbances, and also from eavesdropping by making it impossible to 20 listen to the electromagnetic signals that are emitted by this type of equipment when in operation.

In Figure 2, variant coating apparatus uses discontinuous type feed, and like the above-described apparatus it too presents various workstations that are used 25 in combination, in alternation, or as options.

The paper is fed sheet by sheet 21 onto a conveyor 20 from a feeder bin 15, and the backing medium 24 is fed likewise from a sheet feeder bin 16 coupled to presser cylinders 17. The feeder bins, and the means for spreading 30 the fill of particles which are identical to those described above, are controlled by an automatic dispenser system (not shown) of a type known to the person skilled in the art and adjusted to a travel rate. By way of example, the apparatus can apply glue to 90 cards per minute, with each card having 35 an area of 40 centimeters (cm) by 55 cm.

The means 30 and 40 for applying binder and the means 80 for applying the additional binder are identical to those

described above and are controlled by an optical sequential controller having photoelectric cells 25 connected to the automatic dispenser system.

In this embodiment, the final magnetizer 111 is in the form of an electromagnet and the storage system is in the form of a bin 121 suitable for stacking the sheets coated by the apparatus of the invention, e.g. optionally decorated sheets of paper, card, plastics sheets, or the like.

The invention is not limited to the embodiments described and shown. The method of the invention can also be used to adapt the thickness of the coating as a function of the weight of the two sheets to be stuck together. For example, when laminating a sheet weighing 90 grams (g) (per square meter) onto a sheet having the same thickness or greater thickness it is necessary to use 90 g to 120 g of coating. The magnetized coating of the magnet can also be adapted under the same conditions. In other words, the thickness of the coating can be well adapted to the appearance, the weight, the magnetic force, and the economic cost that are to be imparted.

It is also possible, in particular with discontinuous gluing, to deposit the covering solely in predefined zones or to magnetize only certain zones so as to ensure that magnets will become attached only in those predefined zones

25 that also receive special marking corresponding, for example, to the correct replies to questions printed on the visible face of the medium. Magnetization in zones can be obtained by the magnet having air gaps with the shape of the desired zones, or by employing a set of electromagnets

30 disposed in the form of a matrix and in powering only some of them.

It is also possible to cover both faces of a medium, typically of card or a plastics sheet, with the covering of the present invention so as to enable parts to be stacked.

35 In a variant, a first face of the medium receives a non-magnetized covering while the opposite face receives a covering that can be magnetized. In a second variant

embodiment, both faces receive a covering which is subsequently magnetized in permanent manner.

Furthermore, the apparatus of the invention advantageously includes means for cutting up the coated 5 medium, e.g. for the purpose of forming magnet-type elements which, after being cut out, comprise a portion of medium relating to a subject or adapted to receive another medium relating to the subject, e.g. by means of glue. In this application, the resulting magnets are held on any metallic 10 surface, e.g. a refrigerator door or on any surface (of paper, card, etc.) covered in a metal coating (coating containing metal in powder or filing or other form) or integrating a surface that is completely or partially made of metal (in strip form, a grid, etc.), by using magnetic 15 forces created between the magnets and said metal surface.

CLAIMS

1/ A magnetic coating suitable for being spread substantially regularly over a surface (11), said coating being characterized in that it comprises a binder (12)

5 having embedded therein conductive particles (13) directed by prior magnetization along an inductive electromagnetic field thereby generating an anisotropic medium.

2/ A magnetic coating according to claim 1, in which the 10 conductive particles (13) comprise ferromagnetic particles such as iron oxide particles.

3/ A magnetic coating according to claim 1, in which the conductive particles comprise at least some particles that 15 are not ferromagnetic particles, such as particles of copper in order to provide electromagnetic shielding.

4/ A magnetic coating according to any preceding claim, in which the conductive particles (13) are rod shaped.

20 5/ A magnetic coating according to any preceding claim, in which said binder is selected from a hot-melt adhesive resin, a cold glue, and a paint.

25 6/ A magnetic coating according to the preceding claim, in which the adhesive resin is preferably not electrically conductive.

30 7/ A method of applying a coating on a backing medium (11), the method comprising a step of applying a main binder (12) on the medium while the medium is being guided by a conveyor (20), a step of controlled dispensing and uniform spreading of a fill of conductive particles (13) in the binder, coupled with a step of directing the particles by 35 magnetization, followed by a step of demagnetization, a step of covering the particles in a deposit of an additional binder, and a step of drying the assembly.

8/ A method of applying a coating on a backing medium according to claim 7, wherein, when the fill of conductive particles comprises at least some ferromagnetic particles, the magnetization step is followed by a step of demagnetization, and the drying step is followed by a step of remagnetizing the particles.

9/ A method of applying a coating on a backing medium according to claim 7, in which the controlled dispensing of the fill is performed by programming the powder delivery rate as a function of the density selected for particles, and then by uniform spreading over the pre-glued medium.

10/ A method of applying a coating on a backing medium according to claim 9, in which the magnetization step occurs after the particles have indeed been spread within the main binder following the step of dispensing and spreading the particles, but prior to the binder actually setting by solidifying.

11/ A method of applying a coating on a backing medium according to claim 9, in which the steps of dispensing, of spreading, and of magnetizing the particles are combined in such a manner that the particles are directed by magnetization prior to being actually spread within the binder.

12/ A method of applying a coating on a backing medium according to claim 7, in which an adhesive resin is sprayed as an additional binder covering the particles and to enable a medium to be laminated onto the top surface to serve as a front medium.

13/ A method of applying a coating on a backing medium according to claim 7, in which the covering step consists in spraying a varnish as the additional binder.

14/ Coating apparatus for implementing the method of the invention, the apparatus comprising means for feeding the medium onto a conveyor, means for applying a principal binder via presser rollers and via at least one nozzle, said
5 means being coupled to heater means, a tank of particles coupled to a duster for dispensing the fill of particles, means for spreading the fill of particles within the main binder, electromagnetic means for producing an anisotropic magnetic field for magnetizing the particles, a spray for
10 depositing an additional binder, and dryer means.

15/ Coating apparatus according to claim 14, in which the duster is programmed to deliver the quantity of powder that corresponds to the density selected for the fill, the
15 spreader means are constituted by a system of vibrating screens, and the electromagnetic magnetization means are formed by an electromagnet.

16/ Coating apparatus according to claim 15, in which the
20 spreader means are constituted by at least one measuring-out unit replacing the system of vibrating screens, the unit and the screens forming particular patterns by masking.

17/ Coating apparatus according to claim 14, in which a
25 demagnetizer is placed immediately downstream from the electromagnetic magnetizing means and a final magnetizer is placed downstream from the dryer means, when the fill comprises at least some ferromagnetic particles.

30 18/ Coating apparatus according to claim 14, in which, when feeding is performed continuously, the medium is fed from a winding-off roll, the front medium is fed from a winding-off roll coupled to presser rollers pressing on the conveyor, and a final winding roll provides a reel of the resulting
35 coated medium.

19/ Coating apparatus according to claim 14, in which, when feeding is performed discontinuously, the backing medium is fed sheet by sheet onto the conveyor from a feeder bin, and the front medium is fed likewise from a sheet feeder bin,

5 the feeder bins and the means for spreading the fill of particles being controlled by a dispenser system that is automatic and adjusted to the rate of throughput.

20/ Coating apparatus according to claim 19, in which the
10 means for applying the binder and the means for applying the additional binder are governed by an optical sequential controller having photoelectric cells, and connected to the automatic dispenser system.

15 21/ Coating apparatus according to claim 14, in which means are provided for cutting up the resulting coated medium in order to form elements that are to be held in place on metal surfaces by magnetic forces acting between the element and the metal surface.

ABSTRACT

The invention seeks to provide a magnetized coating suitable for exerting durable magnetic forces. To do this, 5 the method of the invention consists in spreading conductive particles on a medium, the particles being directed by prior magnetization along an inducing magnetic field and being embedded in a binder. The coating apparatus for implementing the method of the invention comprises means for 10 feeding the medium onto a conveyor, means for applying a main binder via presser rollers and via at least one nozzle, said means being coupled to heater means, a tank of particles coupled to a duster for dispensing the fill of particles, means for spreading the fill of particles within 15 the main binder, electromagnetic means for producing an anisotropic magnetic field for magnetizing the particles, a sprayer for depositing an additional binder, dryer means, demagnetizer means, and winder means. The invention is applicable to media particularly in paper-making, games, 20 decoration, or building.

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I declare that:

My residence, post office address, and citizenship are as stated below next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter that is claimed and for which a patent is sought on the invention entitled

MAGNETIC COATING, COATING METHOD WITH SAME AND COATING APPARATUS THEREFOR

the specification of which is attached hereto.
 was filed on June 9, 2000 as International Patent Application Serial No. PCT/FR00/01604, and (if applicable) was amended on _____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information of which I am aware and which is material to the examination of the patent application in accordance with 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designates at least one country other than the United States, listed below and have also identified below, by checking the space, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is not claimed.

Prior Foreign Application(s)

Number	Country	Day/Month/Year Filed	Priority Not Claimed
<u>99/07589</u>	<u>France</u>	<u>15 June 1999</u>	_____
_____	_____	_____	_____
_____	_____	_____	_____

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

Application Serial Number	Filing Date
_____	_____

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information known to me which is material to the patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Application Serial Number	Filing Date	Status (patented, pending, abandoned)
_____	_____	_____

Each undersigned applicant hereby appoints **CONRAD J. CLARK (Registration No. 30,340)** and **CHRISTOPHER W. BRODY (Registration No. 33,613)**, as his attorneys with full power of substitution to prosecute the subject application and to transact all business in the Patent and Trademark Office connected therewith.

Send Correspondence to: **CLARK & BRODY, 1750 K Street, NW, Suite 600, Washington, DC 20006; Telephone: 202-835-1111; Facsimile: 202-835-1755.**

I hereby declare that all statements made herein of my own knowledge are true and that all statement made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor, if any: Claude Texier

Inventor's signature: _____ Date: _____

Residence: Thorigny-sur-Marne, France

Citizenship: France

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As a below named inventor, I declare that:

My residence, post office address, and citizenship are as stated below next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter that is claimed and for which a patent is sought on the invention entitled

MAGNETIC COATING, COATING METHOD WITH SAME AND COATING APPARATUS THEREFOR

the specification of which is attached hereto.
 was filed on 11 June 9, 2002 as International Patent Application Serial No. PCT/FR02/01804, and (if applicable) was amended on

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information of which I am aware and which is material to the examination of the patent application in accordance with 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(c) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designates at least one country other than the United States, listed below and have also identified below, by checking the space, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is not claimed.

Prior Foreign Application(s)

Number	Country	Day/Month/Year Filed	Priority Not Claimed
<u>99/075302</u>	<u>France</u>	<u>11 June 1999</u>	<u></u>
<u></u>	<u></u>	<u></u>	<u></u>

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

Application Serial Number	Filing Date
<u></u>	<u></u>

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information known to me which is material to the patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

Application Serial Number	Filing Date	Status (abandoned, pending, abandoned)
<u></u>	<u></u>	<u></u>

Each undersigned applicant hereby appoints CONRAD J. CLARK (Registration No. 30,360) and CHRISTOPHER W. BRODY (Registration No. 33,613), as his attorneys with full power of substitution to prosecute the subject application and to transact all business in the Patent and Trademark Office connected therewith.

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I hereby declare that all statements made herein of my own knowledge are true and that all statement made on information and belief are believed to be true; and further that those statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 101 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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